

### Centralized Management of Wireless Network

- + Tracks and Maintains User Authentication as Users Roam throughout the Network
- + Intelligently Designates Users to Virtual Groups Based on User's Authenticated Identity
- + Provides Scaled, Resilient, Integrated Management Infrastructure
- + Centrally Manages User Authentication/Security Policies
- + Provides Key Management for Each Security Protocol
- + Configures and Controls All Connected Access Points

### Simplified & Resilient Network Deployment

- + 802.3af Power Over Ethernet Simplifies AP Installation
- + Gigabit Connection Ready for Future Wireless Speed Upgrade
- + Redundant Power Supply Support Maximizes Network Uptime
- + Auto-Healing Around Failed Access Points Ensures Coverage Integrity

### Unified

- + Provides Centralized Security/Management for WLAN Infrastructure
- + Provides 802.3af PoE, Auto-Adjustment of RF Channels & Remote Boots for AP
- + Automatically Configures All Attached AP
- + Detects Rogue AP to Increase Wireless Security

### Wireless Access Point

- + Simultaneous 802.11a/g Wireless Connectivity
- + Provides 802.3af PoE Support
- + Detachable External Antennas, Can Be Replaced With Optional High Gain Antennas for Maximum Signal Coverage
- + Plenum Rated Casing
- + Sensitive Configuration Information Not Locally Stored
- + Security: WEP, WPA/WPA2, Multiple SSIDs



## Unified Wired/Wireless Switching

### Overview

The D-Link® Unified Wired/Wireless Switching solution provides an innovative evolution in wireless LAN. Complex installations, intricate management utilities and limited scalability had previously made network administrators hesitant to deploy facility-wide wireless LAN. Now, D-Link Unified Wired/Wireless Switching architecture simplifies installation. In addition, access security, wireless throughput and network convergence is significantly enhanced. Benefactors of this Wi-Fi® innovation include IT integrators, network administrators, business end-users, government organizations, schools, hospitals, and hotspots such as convention halls, hotels and airports.

### Scalable and Flexible Wireless Deployment

The centerpiece of D-Link Unified Wired/Wireless Switching lies in a scalable and flexible architecture. The Unified Switch can be easily added to the customer's existing network infrastructure and centrally manage the Access Points. Overlay Deployment protects the customer's investment on the wired network, while providing wireless LAN capability to the entire organization. Furthermore, the Unified Switch can be deployed at the network edge as a wireless controller and an L2 edge switch. This type of edge deployment is beneficial for customers looking to replace their current switches with a more robust and full-featured product. The D-Link Unified Switch is designed for medium-sized to large wireless networks. This affordable solution provides flexibility and investment protection through scalable expansion and unified LAN/ WLAN deployment and easy upgrades for future technologies through Gigabit connectivity.

### Adaptable Wireless Technology

The Unified Switch's flexible architecture not only includes physical deployment, but also offers effective wireless traffic management capability. Data from the clients can be configured to tunnel back to the Unified Switch before reaching its destination. This approach allows for a coordinated network control and centralized security policy enforcement. Alternatively, Access Points can handle and forward wireless traffic ideally without having to go through the Unified Switch. This non-tunnel mode is especially practical in remote offices or applications that require high performance and optimized traffic flows. The flexibility offered by D-Link Adaptable Wireless technology empowers any organization to enjoy the benefits of a wireless network.

### Centralized Policy Control

Profile configuration is applied to a wireless access point when it is deployed or when it is reset. Profiles dispatched from the switch to the AP include RADIUS server settings, radio configuration, SSID, VLAN, tunnel settings, and QoS configuration. Configuration is simplified because the administrator does not have to make individual settings for each AP. This enhances security because the configuration is not saved within the AP, hence it cannot be retrieved when an AP is dismantled or stolen.



## AP Management

- + Each Switch Can Manage Up to 48 Wireless APs
- + Switch Ports Directly or Indirectly Connect to APs
- + Mixed Wired Device/Wireless AP Connection From Any Port
- + System Expandability: Can Include Up to 4 Peer Switches

## AP Configuration & Security

- + Self-Tuning Features to Adjust & Optimize RF Settings
- + 64/128/152-bit WEP Data Encryption
- + WPA/WPA2 Personal
- + WPA/WPA2 Enterprise
- + 802.1x User Authentication
- + 802.1Q VLAN Tagging for Network Segmentation
- + MAC Address Filtering
- + 8 SSID per Radio
- + WMM (Wi-Fi Multimedia) Certified

## Unified Wired/Wireless Switching

### Enhanced and Resilient Security

The D-Link Unified Switch provides the highest levels of security for both voice and data, with support for MAC Authentication, Captive Portal, and industry standard personal/enterprise WPA/WPA2 security. WPA2 utilizes the Advanced Encryption Standard (AES), which is considered to be the most robust and secure encryption algorithm. The Unified Switch also provides means to define and detect Rogue APs, preventing illegal intrusions into the internal network. Security can be pre-set and RF channels auto-adjusted for each AP, so when an AP is added or removed, the entire network does not have to be reconfigured. The switch will automatically configure the new AP with the same configuration as the previous units.

### Dual Band Wireless Access Point

The DWL-8500AP operates on simultaneous dual 2.4GHz and 5GHz frequency bands. This system provides automatic adjustment of 802.11a/b/g RF channels, multiple SSID for each frequency band, and optimal transmit power to provide mobile users with high quality, secure wireless signals.

### Uninterrupted Wireless Connectivity

The system maintains a centralized database of wireless user's access information such as their MAC addresses and authentication keys. As wireless users roam around the office using wireless equipment, they may change their connection from AP to AP. By constantly monitoring the AP status, the switch can establish AP-to-AP roaming for these users without requiring them to re-establish authentication keys. This fast roaming process results in disruption-free, reliable wireless connectivity crucial for mobile applications such as Wi-Fi® IP phone and wireless PDA connection. In addition to updating information of APs managed by the same switch, the system also supports AP information updates across multiple peer switches. As a wireless user moves from one AP affiliated to a switch to another AP connected to another switch, inter-switch roaming is instantly performed across the peer switches to produce a smooth, fast wireless connection in a multi-departmental enterprise environment.

### Unified AP

The DWL-8500AP can be configured either as managed or standalone APs. In managed mode, the switch automatically discovers and centrally manages the APs. Furthermore, all the configuration files and security settings are pushed to the APs, significantly reducing IT overhead as the WLAN network scales up. With WLAN, users have the mobility to move around the network; therefore the authentication and user tracking are executed on the Unified Switch with a consolidated and secure wireless system. They can also act as standalone APs depending on the application or network condition.

### Captive Portal

Apart from the wireless encryption standards, the Unified Switch offers an addition level of security called "Captive Portal". Captive Portal is a web-based authentication process in which the wireless clients request for access through the web browser. The AP or switch port captures HTTP/HTTPS traffic and then re-directs the client to an authentication portal. Once the username and password of the client has been authenticated by either the switch or the RADIUS server, access is granted. Captive Portal is SSID-based and supports fast roaming, making it an ideal security solution.

### Automatic Channel and Power Adjustment

Normally, when adding APs to the network, system administrators select the unoccupied or least used RF channels to avoid interference with other AP and RF devices. They also set transmitter output power at a level, strong enough for RF signals to reach wireless clients, but weak enough to minimize interference with other devices' RF signals. To simplify this process and optimize RF usage, the switch automatically adjusts the RF channels and transmitter output power of the entire system every time an AP is added to or removed from the network. This automatic adjustment can be programmed to take effect at a certain time or at specified intervals, minimizing the need for network administrator to manually intervene.



## Unified Wired/Wireless Switching

### Self-Healing and Load Balancing

D-Link DWS series switches offer Self-healing process and an AP load balancing features to increase the resiliency of a wireless network. To make up for a sudden RF signal vacuum created by any "dead" AP (AP with DC power failure), the switch automatically increases the transmitter output power of all the neighboring APs to expand their RF coverage, thereby "healing" the network "wound". "Self-healing" can also be accomplished with a redundant switch, which can take over the management of the AP if and when the AP loses connection with the first switch. To ensure continuous connection for current clients, the switch performs load balancing across the access points when network traffic reaches a certain threshold, while rejecting new client-to-AP associations to avoid bandwidth overcrowding.

### Unified Switch Architecture

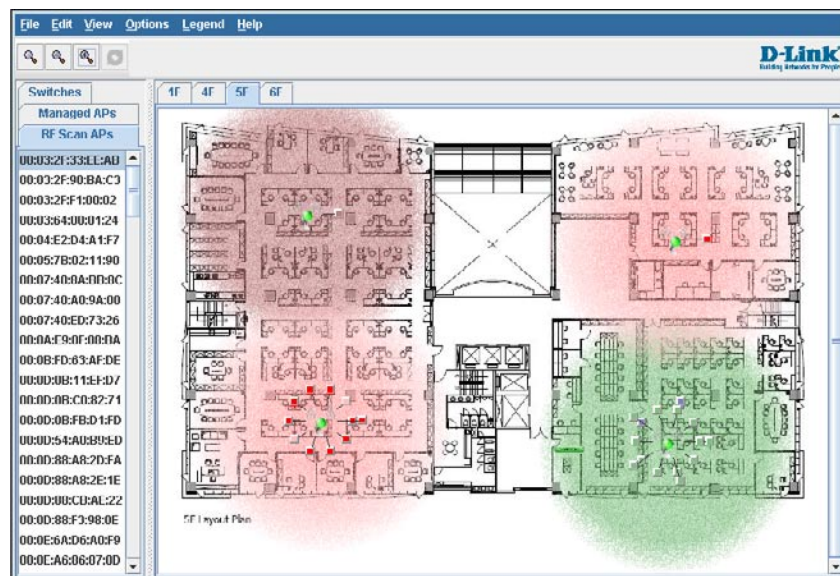
In addition to being the core unit of the wireless switching system, the DWS-3024 switch can also function as an advanced wired device. Features such as IP routing, ACL, QoS, security features, and Gigabit/10-Gigabit fiber support, allow businesses to integrate their enterprise wireless networks with the wired network infrastructure. The DWS-3024 Unified Switch can be used to upgrade their current 10/100Mbps desktop connections to Gigabit capability. Seamlessly upgrade to an 802.11n AP with Gigabit connections in the future. The advantages include flexibility to act as wireless controllers or dedicated full-featured multi-layer LAN switches, or as dual-role devices.

### Medium to Large Business Application

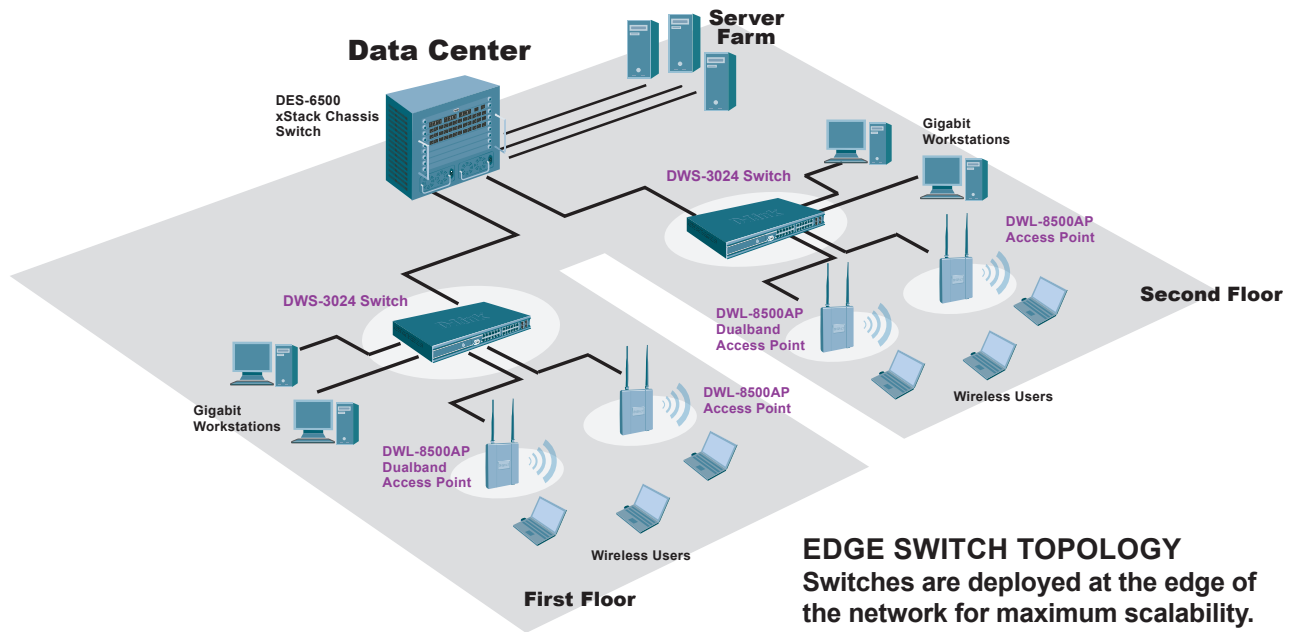
Capable of handling up to 48 access points, D-Link Unified Wired/Wireless Switching is suitable for deployment in either a medium or large network supporting VoIP and numerous mobile wireless applications. A network site can begin with one switch to manage a few APs or to use for mixed wired/wireless LAN purposes. When the number of APs is augmented, up to four switches in a peer-to-peer configuration can be added to form a large centralized management system capable of handling up to 192 access points in one roaming group.

### Network Visualization and Management

By entering the IP address of a managed switch or into the Internet browser, administrators can view the topological map and identify the locations of the AP and the switch. The map displays AP icons and colors used to differentiate between the different RF channels used by the AP. Administrators can create individual user profiles and be informed of any rogue APs. Users' authentication is based on profiles and not on any specific access point. As users move around within a network, their movement can be traced as they roam from one access point to another.

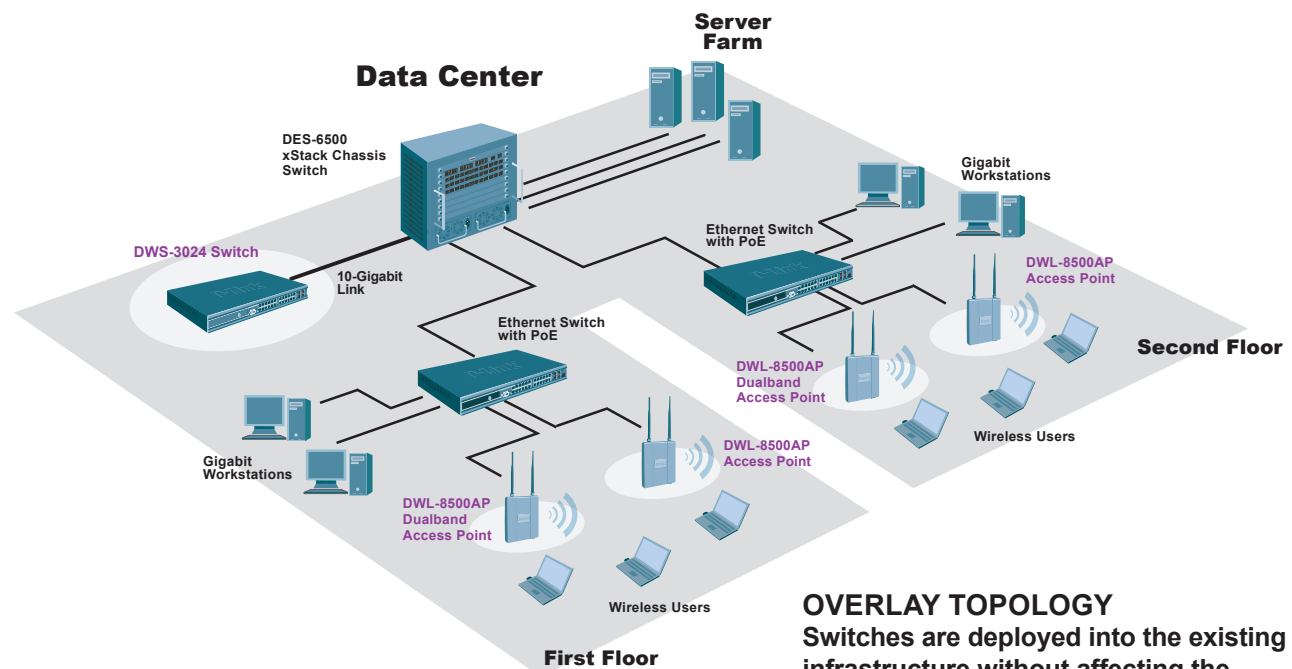


### Unified Wired/Wireless Switching



#### EDGE SWITCH TOPOLOGY

Switches are deployed at the edge of the network for maximum scalability. Access Points can be powered and directly connected to the switches.



#### OVERLAY TOPOLOGY

Switches are deployed into the existing infrastructure without affecting the wired network. Access Points can be powered and indirectly connected to the PoE switches.



## Unified Wired/Wireless Switching

### Technical Specifications

### Product Specifications

Device Interfaces	24 10/100/1000BASE-T Gigabit Ports With Integrated 802.3af PoE		
	4 Combo SFP Ports		
	RS-232 Console Port		
MAC Address Table	8k		
Switching Capacity	48Gbps		
Maximum Forwarding Rate	35.71Mpps		
Forwarding Method	Store and Forward		
Packet Buffer Memory Size	750KB		
802.3af Power over Ethernet (PoE)	15.4W Per Port		
	370W Total Voltage Output		
	Auto Disabled If Port Current Exceeds 350mA		
Number of VLANs Per Device	3,965		
Quality of Service (QoS)	802.1p Priority Queues (Up to 8 Queues per Port)		
	CoS Based on:	- VLAN	- DSCP
	- Switch Port	- Destination/Source IP Address	- TOS, Destination/Source MAC Address
	- TCP/UDP Port		
Spanning Tree	Bandwidth Control: Granularity of 1% link speed		
	802.1D Spanning Tree		
	802.1w Rapid Spanning Tree		
Security	802.1s Multiple Spanning Tree		
	RADIUS Authentication for Management Access		
	TACACS+ Authentication for Management Access		
	SSH v1, v2		
	SSL v3		
	Port Security:	- 20 MAC Addresses per Port	- Trap Violation Notification
	802.1x Port-Based Access Control		
	Denial of Service Protection		
	Broadcast Storm Control: Granularity of 1% link speed		
L3 Features	IPv4 Static Route		
	Up to 128 Static Routes		
	Floating Static Route		
	VRRP		
Access Control Lists (ACL)	Based on: Switch Port, MAC Address, 802.1p, Priority Queues, VLAN, Ethertype, DSCP, IP Addresses, Protocol Type, TCP/UDP Port		
Jumbo Frame Support	Up to 9KB		
IGMP Snooping	1K Multicast Groups		



### Unified Wired/Wireless Switching

Flow Control	802.3x Standard in Full Duplex Mode
	Back Pressure in Half Duplex Mode
Port Mirroring	Supports one-to-one or many-to-one
Link Aggregation	Supports up to 32 8-port groups
Web-based Graphic User Interface (GUI)	Compatible with Internet Explorer®, Netscape®, Mozilla®, Firefox®, Opera®, Safari® browsers

### Wireless

WLAN Management Capability	Up to 48 APs (Directly Connected and Indirectly Connected Through LAN Switch) and up to 512 Wireless Users		
Roaming	Fast Roaming / Intra-Switch Roaming / Inter-Subnet Roaming		
Access Control & Bandwidth Management	Up to 16 SSID per AP (8 SSID per RF Frequency Band)		
	AP Load Balancing		
AP Management	Auto-Discovery		
	Remote Reboot		
	Monitoring: List Managed AP, Rogue AP, Authentication Failed AP		
	Client Monitoring: List Clients Associated with Each Managed AP		
	Ad-hoc Clients Monitoring		
	Authentication Supporting Local Database and External RADIUS Server		
	Centralized RF/Security Policy Management		
WLAN Security	WPA Personal/Enterprise		
	WPA2 Personal/Enterprise		
	64/128/152-bit WEP Data Encryption		
	Wireless Station and AP Classification (Based on RF Channel, MAC Address, SSID, Time)		
	Rogue and Valid AP Classification Based on MAC Address		
	Encryption Type Support:		
	<div><div>- WEP</div><div>- TKIP</div><div>- TTLS</div><div>- EAP-FAST</div></div>	<div><div>- WPA</div><div>- AES-CCMP</div><div>- PEAP-GTC</div></div>	<div><div>- Dynamic WEP</div><div>- EAP-TLS</div><div>- PEAP-MS-CHAPv2</div></div>

### Interface Options

RJ-45	24 10/100/1000BASE-T Gigabit Ports with Integrated 802.3af PoE
SFP Ports	4
Diagnostic LEDs	Per Device: Power, Console, RPS
	Per 10/100/1000BASE-T Port: Link/Activity/Speed, PoE Mode
	Per SFP Slot: Link/Activity





### Unified Wired/Wireless Switching

#### Network Management

In & Out of Band

Web-Based GUI  
Telnet Server: Up to 5 Sessions  
TFTP Client  
Multiple Configuration Files  
BOOTP/DHCP Client  
SNTP  
Dual Images  
CLI  
Telnet Client  
SNMP v1, v2c, v3  
RMON v1: 4 Groups (Statistics, History, Alarms, Events)  
DHCP Server  
SYSLOG

#### Network Protocol and Standards

IEEE 802.1q VLAN Tagging, GVRP, 802.1p Quality of Service, 802.1D Spanning Tree Protocol, 802.1w Rapid Spanning Tree Protocol, 802.1s Multiple Spanning Tree Protocol, 802.3x Flow Control, 802.3ad Link Aggregation, 802.3af Power over Ethernet, 802.11a/b/g, 802.1x Port-Based Access Control

IETF RFC 1157 SNMP, RFC1213 MIB-II, RFC1493 Bridge MIB, RFC1907 SNMPv2 MIB, RFC1757/2819 RMON MIB, RFC1643/2358/2665 Ether-like MIB, RFC2674 802.1p MIB, RFC2233/2863 IF MIB, RFC2618 RADIUS AuthenticationClient MIB, RFC2620 RADIUS AccountingClient MIB, RFC 3768, RFC 4251

Wi-Fi Helps ensure interoperability with Wi-Fi® Certified products from other vendors

#### Electrical & Emissions Summary

Emissions FCC Class A, VCCI, C-Tick, ICES-003, CE

Safety Compliance UL/cUL, CB

AC Input Power 100 to 240 VAC, 50/60 Hz Internal Universal Power Supply

Maximum Power Consumption 450 Watts (with all PoE ports in operation)

Heat Dissipation 1535.49 BTU/hr

Ventilation DC Fans 4 40 x 40 mm DC Fans

Redundant Power Supply Connector for Optional External DPS-600

#### Physical & Environmental

Temperature Operating: 32° to 104°F (0° to 40°C)  
Storage: 14° to 158°F (-10° to 70°C)

Humidity Operating: 10% ~ 90% Non-condensing  
Storage: 5% ~ 90% Non-condensing

Dimensions 17.2 x 15.3 x 1.7 inches (440 x 389 x 44 mm)  
19-inch Standard Equipment Rack Mount Width, 1U Height

Weight 13.2 lbs (6kg)



Unified Wired/Wireless Switching

Physical & Environmental

Warranty	Limited Lifetime <sup>1</sup>
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Ordering Information

<u>Part Number</u>	<u>Description</u>
DWS-3024	Managed 24-Port Gigabit L2+ Unified Wireless PoE Switch, 4 Combo SFP Ports
DWL-8500AP	Unified Wireless PoE Access Point, 802.11a/g
DPS-600	Redundant Power Supply Unit 500 Watt RPSU

<sup>1</sup> Available only in the USA and Canada.

All references to speed are for comparison purposes only. Product specifications, size, and shape are subject to change without notice, and actual product appearance may differ from that depicted herein.